

CLAIM(S):

~~1. A process of manufacturing a pasta filata cheese or a mozzarella-like cheese comprising:~~

~~providing a milk composition having a selected protein and fat composition;~~

~~pasteurizing the milk composition;~~

~~forming a coagulum from the milk composition;~~

~~cutting the coagulum to separate curd and whey;~~

~~draining the whey from the curd;~~

~~heating the curd without aqueous immersion to an approximate temperature range of 130°F to 160°F;~~

~~mechanically working the curd into a fibrous mass; and~~

~~forming the cheese into a selected shape.~~

~~2. The process of claim 1 wherein a GRAS ingredient is mixed into the curd prior to mechanical working of the curd.~~

2. The process of claim 1 wherein the curd is comminuted to a selected size.

3. The process of claim 1 wherein the coagulum is heated after being cut to facilitate moisture removal from the curd.

4. The process of claim 1 wherein the milk composition is fresh milk.

5. The process of claim 1 wherein the milk composition is recombined milk.

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The process of claim ~~8~~⁵ wherein the recombined milk is prepared from either protein concentrate, acid casein, rennet casein, caseinates, nonfat dry milk, whey, whey protein concentrate, whey protein isolate, cream, or condensed milk or any combination thereof.

8. The process of claim 1 and further adding a salt composition to the curd prior to mechanical working.

9. The process of claim 8 wherein the salt composition includes an alkaline earth salt of simple or complex chlorides, sulfates, phosphates or citrates used in the manufacture of process cheese, cheese food, cheese spread, cheese sauce or imitation or analog cheeses.

10. The process of claim 9 wherein the alkaline earth salt is a sodium, potassium, calcium, magnesium or salt.

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The process of claim 1 wherein a non dairy ingredient is added to the curd prior to mechanical working.

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The process of claim ~~11~~¹⁰ wherein the non-dairy ingredient is a functional carbohydrate, a lipase, a protease, a mineral acid, an organic acid, a structural protein, or an antimicrobial agent or a combination thereof.

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The process of claim 1 wherein a dairy ingredient is added to the curd prior to mechanical working.

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14. The process of claim 13 wherein the dairy ingredient is either a milk, cream, yogurt, skim solids, or cheese that is dry, condensed, fluid, unripened, fermented or pH reduced or any combination thereof.

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15. The process of claim ¹⁰11 wherein the nondairy ingredient if in dry form is mixed in an aqueous solution containing about five to fifty percent by weight of the dairy ingredient.

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16. The process of claim ⁷8 wherein the salt composition if in dry form is mixed in an aqueous solution containing about five to fifty percent by weight of the salt composition.

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17. The process of claim ¹³14 wherein if the dairy ingredient is in dry form is mixed in an aqueous solution containing about five to fifty weight percent of the dairy ingredient.

18. The process of claim 1 wherein an emulsifying salt composition is added to the curd via a starter culture medium.

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19. The process of claim 1 wherein a non-dairy ingredient is added to the curd via a starter culture medium.

20. The process of claim 1 wherein a dairy ingredient is added to the curd via a starter culture medium.

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21. The process of claim 1 wherein the cheese has a final moisture content in the range of about 20 to about 90 weight percent.

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~~22.~~ ¹⁸
¹⁶ The process of claim ~~21~~ wherein the cheese has a final moisture content in the range of about 30 to 60 weight percent.

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~~23.~~ ¹⁶ The process of claim ~~21~~ wherein the cheese final moisture content is adjustable by the addition of inert ingredients.

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~~24.~~ ¹⁸ The process of claim ~~23~~ wherein the inert ingredients are either structural carbohydrates or silicates or a combination thereof.

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~~25.~~ The process of claim 1 wherein the mechanical working of the curd is done in a waterless cooker.

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~~26.~~ The process of claim 1 and further including:
cooling the cheese after the cheese is formed into the selected shape.

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~~27.~~ ²¹ The process of claim ~~26~~ and further packaging the cooled cheese.

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~~28.~~ ²¹ The process of claim ~~26~~ wherein the cheese is formed into either a circular, oval or rectangular cross-sectional shape between 0.25 inch to 15 inches in diameter or width or both in a horizontal or vertical plane.

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~~29. The process of claim 26 wherein the cheese is formed into shape by being extruded directly into packaging.~~

30. The process of claim 1 wherein pH of the curd is adjusted after the whey is drained to a pH range of approximately 5.0 to 5.4.

31. A product produced by the process of claim 1 characterized by retention of mozzarella-like stringy texture even after two months from creation.

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A process of manufacturing a pasta filata cheese or a mozzarella-like cheese comprising:

providing a milk composition having a selected protein and fat composition;

pasteurizing the milk composition;

forming a coagulum from the milk composition;

cutting the coagulum to separate curd and whey;

draining the whey from the curd;

heating the curd to an approximate temperature range of 130°F to 160°F;

adding phosphate or citrate emulsifying salts or a combination thereof to the curd;

mechanically working the curd into a fibrous mass; and

forming the cheese into a selected shape.

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The process of claim 22 wherein the emulsifying salt is an alkaline earth salt.

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The process of claim 23 wherein the alkaline earth salt is a sodium, potassium, calcium, magnesium salt.

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The process of claim 22 wherein the salt is mixed into the curd in the form of an aqueous solution containing about 5 to 50% of the salt based on the weight of the solution.

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26. The process of claim 32 wherein the cheese has a finished moisture content in the range of 40 to 60% after being formed into the selected shape.

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27. The process of claim 32 wherein the temperature of the curd is in the approximate range of 20 to 160°F when adding the emulsifying salts.

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28. The process of claim 32 wherein the aqueous solution is mixed into the curd for a period of time ranging from approximately 2 to 60 minutes prior to heating the curd.

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29. The process of claim 32 wherein the cheese is formed into the selected shape by being extruded into packaging.

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40. The process of claim 32 wherein forming the cheese into the selected shape includes forming the cheese into an intermediate shaped extrudate by extrusion onto a chill roll or continuous belt.

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41. The process of claim 32 wherein the cheese produced by the process of claim 30 is characterized by a shelf life of up to six months.

42. A product produced by the process of claim 32 characterized by retention of mozzarella-like stringy texture even after two months from creation.

43. A process of manufacturing a pasta filata cheese or a mozzarella-like cheese comprising:

providing a milk composition having a selected protein and fat composition;

pasteurizing the milk composition;

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forming a coagulum from the milk composition;
 cutting the coagulum to separate curd and whey;
 draining the whey from the curd;
 adding generally recognized as safe ingredients into the curd in
 amounts effective to obtain selected compositional or
 functional properties in a final cheese product;
 heating the curd to a range of approximately 130 to 160°F;
 mechanically working the cheese curd into a fibrous mass; and
 forming the cheese into a selected shape.

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The process of claim 43 wherein heating the curd to
 approximately 130 to 160°F and mechanically working the cheese into a fibrous
 mass are separate and distinct steps.

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The process of claim 43 wherein the cheese is formed into a
 selected shape by cooling.

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The process of claim 43 wherein the cheese is packaged hot and
 then cooled.

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47. The process of claim 43 wherein the generally recognized as safe
 ingredient includes a salt composition comprising of simple or complex
 chlorides or both, sulfates, phosphates or citrate cheese emulsifying salts or
 combination thereof.

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The process of claim 47 wherein the emulsifying salt is an
 alkaline earth salt.

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49. The process of claim 48 wherein the alkaline earth salt is sodium, potassium, calcium, magnesium or salt.

50. The process of claim 43 wherein the generally recognized as safe ingredients comprise non-dairy ingredients that include either functional carbohydrates, lipase, protease, mineral acid, organic acid, structural protein, or anti-microbial agents, or any combination thereof.

51. The process of claim 43 wherein the generally recognized as safe ingredients comprise dairy ingredients that include either a milk, cream, yogurt, skim solids, or cheese that is dried, condensed, fluid, unripened, fermented or pH reduced or any combination thereof.

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52. The process of claim 50 wherein the non-dairy ingredients are in dry form and are mixed in an aqueous solution containing about 5 to 50 weight percent of the non-dairy ingredient.

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53. The process of claim 51 wherein the dairy ingredient are in a dry form and are mixed in an aqueous solution containing about 5 to 50 weight percent of the dairy ingredient.

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54. The process of claim 47 wherein the salt composition is in a dry form and is mixed in an aqueous solution containing about 5 to 50 weight percent of the salt composition.

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55. The process of claim 43 wherein the cheese has a finished moisture content in the range of about 40 to 60 weight percent.

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The process of claim 43 wherein the cheese is formed into either a circular, oval or rectangular cross-sectional shape between 0.25 inch to 15 inch diameter or with or both in a horizontal or vertical plain.

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The process of claim 42 wherein the cheese is formed into shape by being extruded directly into packaging.

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The process of claim 43 wherein the cheese is characterized by a shelf life of up to six months.

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A product produced by the process of claim 43 characterized by retention of mozzarella-like stringy texture even after two months from creation.

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A process of manufacturing a pasta filata cheese or a mozzarella-like cheese comprising:

providing a milk composition having a selected protein and fat composition;

adding an acidifying agent to the milk composition;

pasteurizing the milk composition after acidification;

cutting the coagulum to separate curd and whey;

draining the whey from the curd;

heating the curd to an approximate temperature range of 130°F to 160°F;

adding phosphate or citrate emulsifying salt or a combination therefore to the curd;

mechanically working the curd into a fibrous mass; and

forming the cheese into a selected shape.

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The process of claim ~~60~~⁵² wherein the emulsifying salt is an alkaline earth salt.

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62. The process of claim 61 wherein the alkaline earth salt is a sodium, potassium, calcium, magnesium or salt.

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The process of claim ~~60~~⁵² wherein the salt is mixed into the curd in the form of aqueous solution containing about 5 to 50% of the salt, based on the weight of the solution.

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The process of claim ~~60~~⁵² wherein the cheese has a moisture content in the range of 40 to 60% after being formed into the selected shape.

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The process of claim ~~60~~⁵² wherein the temperature of the curd is in the approximate range of 20 to 160°F when adding the emulsifying salts.

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The process of claim 64 wherein the aqueous solution is mixed into the curd for a period of time ranging from prior to heating the curd.

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The process of claim ~~60~~⁵² wherein the cheese is formed into the selected shape by being extruded into packaging.

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The process of claim ~~60~~⁵² wherein forming the cheese into the selected shape includes forming the cheese into an intermediate shaped extrudate by extrusion onto a chill roll or continuous belt.

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The process of claim 60 wherein the cheese produced by the process of claim 30 is characterized by a shelf life of up to six months.

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An improved process of manufacturing a pasta filata cheese or a mozzarella-like cheese, the improvement comprising:

after a coagulum is formed from a milk composition, and the coagulum cut to separate the curd and whey and the whey drained from the curd, heating the curd in an aqueous free environment to an approximate temperature range of 130°F to 160°F and mechanically working the curd in the aqueous free environment until a mozzarella-type texture is achieved.

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The process of claim 70 wherein the curd is comminuted to a selected size prior to heating.

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The process of claim 70 wherein the coagulum is heated after being cut to facilitate further moisture removal from the curd.

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The process of claim 72 wherein the pH of the drained curd is adjusted to a range of 5.2 to 5.4.

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The process of claim 70 wherein a GRAS ingredient is mixed into the curd prior to mechanical working of the curd.

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The process of claim 74 wherein the GRAS ingredient is either a cheese emulsifying salt, a non-dairy ingredient, or a dairy ingredient.

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76. The process of claim 75 wherein the emulsifying salt includes simple or complex chlorides, phosphates or citrates or a combination thereof.

77. The process of claim 75 wherein the non-dairy ingredient includes a functional carbohydrate, a lipase, a protease, a mineral acid, an organic acid, a structural protein or an antimicrobial agent or a combination thereof.

78. The process of claim 75 wherein the dairy ingredient is either a milk, cream, yogurt, skim solids, or cheese that is dry, condensed, fluid, unripened, fermented or pH reduced or any combination thereof.

79. The process of claim 75 wherein the emulsifying salt, the dairy ingredient or the non-dairy ingredient if in dry form is mixed in an aqueous solution containing about 5 to 50% by weight of the emulsifying salt, the dairy ingredient or the non-dairy ingredient.

80. A product produced by the process of claim 60 characterized by retention of mozzarella-like stringy texture even after two months from creation.

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